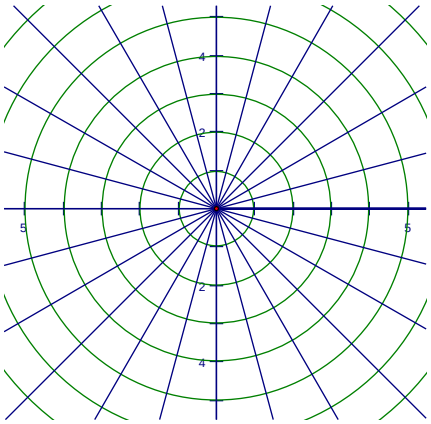
1. Use the polar plane below as an aid in the following exercises.

(a) Locate the polar points $(4, 3\pi/2)$ and $(2\sqrt{2}, 3\pi/4)$ and label them A and B respectively.

(b) Determine the (x, y) addresses for both A and B.

(c) Write the Cartesian equation of the line that passes through A and B as a function of x.

(d) Write the Polar equation of the line that passes through A and B as a function of θ.



2. Use the polar plane below as an aid in the following exercises.

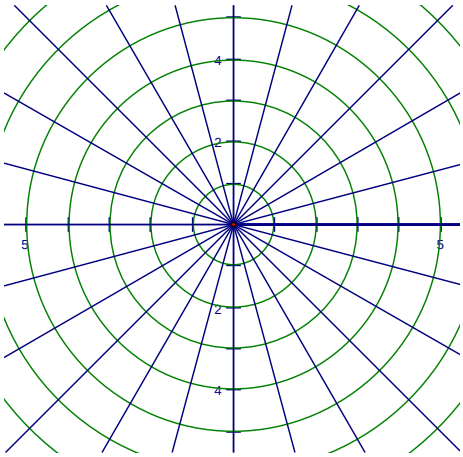
(a) Locate the Cartesian points $(3, 3)$ and $(-4, 0)$ and label them A and B respectively.

(b) Determine an (r, θ) address for each of the points A and B.

(c) What is the polar equation of the line perpendicular to $\overline{AB}$ that passes through the pole?

(d) Sketch the region in the plane whose polar coordinates satisfy the following conditions:

$1 \le r \le 3$ and $\frac{5\pi}{3} \le \theta \le \frac{11\pi}{6}$



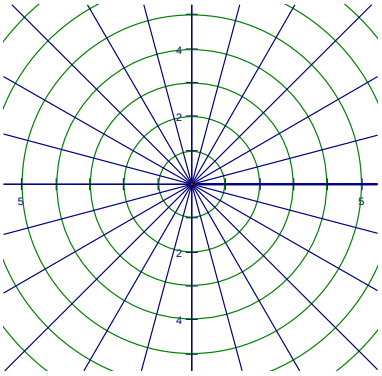
3. Consider the polar graphs defined by $r = 2$ and $r = 2(1 - \sin\theta)$ for $\theta \in [0, 2\pi]$.

(a) Sketch the two polar curves carefully to the right.

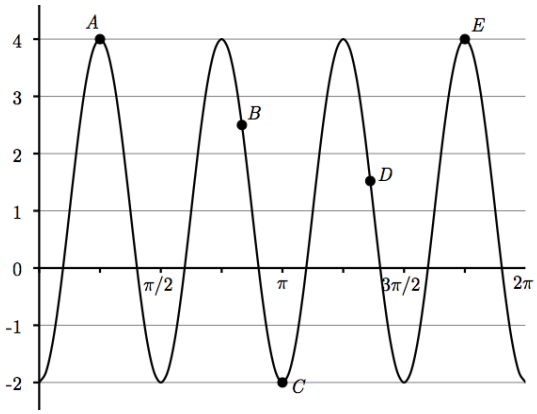
(b) Determine the points of intersection (r, θ) of the graphs.

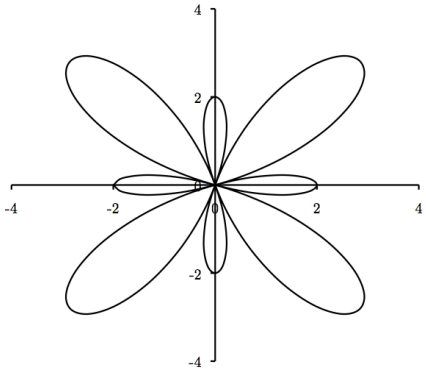
(c) Determine all values of θ where the graph of $r = 2$ achieves vertical tangency.

(d) Determine all values of θ where the graph of $r = 2(1 - \sin\theta)$ achieves horizontal tangency.



4. The Cartesian (y vs. x) graph of a function f is shown below to the left. The polar graph of $r = f(q)$ is shown to the right. The points A, B, C, D, and E lie on the Cartesian graph. Each of these points corresponds to a point on the polar graph. On the polar graph, plot, label, and write the exact coordinates of A, C, E. Plot and label approximate locations of B and D.





5. The Cartesian (y vs. x) graph of a function f is shown below to the left. In the polar axis to the right, draw a graph of the corresponding polar curve described by $r = f(\theta)$.